Factoring a monomial (GCF) from a polynomial [If factoring is impossible write non-factorable]

1) $6a^2 - 15a$

$\boxed{3a(2a-5)}$

2) $32b^2 + 12b$

$\boxed{4b(8b+3)}$

3) $4x^3 - 3x^2$

$\boxed{x^2(4x-3)}$

4) $12a^5b^2 + 16a^4b$

$\boxed{4a^4b(3ab+4)}$

5) $3a^2 - 10b^3$

Non-Factorable

6) $9x^2 + 14y^4$

Non-Factorable

7) $x^5 - x^3 - x$

$\boxed{x(x^4 - x^2 - 1)}$

8) $16x^2 - 12x + 24$

$\boxed{4(4x^2 - 3x + 6)}$

9) $2x^5 + 3x^4 - 4x^2$

$\boxed{x^2(2x^3 + 3x^2 - 4)}$

10) $x^2y^4 - x^2y - 4x^2$

$\boxed{x^2(y^4 - y - 4)}$

11) $x^{2n} + x^n$, **where** $(n > 0)$

$\boxed{x^n(x^n + 1)}$

12) $a^{3n} - a^{2n}$, **where** $(n > 0)$

$\boxed{a^{2n}(a^n - 1)}$

13) $a^{2n+2} + a^2$, **where** $(n > 0)$

$\boxed{a^2(a^{2n} + 1)}$

14) $b^{n+5} - b^5$, **where** $(n > 0)$

$\boxed{b^5(b^n - 1)}$

15) $6t^{2n} - 9t^n$, **where** $(n > 0)$

$\boxed{3t^n(2t^n - 3)}$

16) $12x^2y^2 + 18x^3y - 24x^2y$

$\boxed{6x^2y(3x + 2y - 4)}$

17) $-16a^2b^4 - 4a^2b^2 - 24a^3b^2$

$\boxed{-4a^2b^2(6a + 4b^2 + 1)}$

Factor by Grouping [Note that : $y-x=-(x-y)$]

18) $x(a+2)+2(a+2)$

$\boxed{(a+2)(x+2)}$

19) $3(x+y)-a(x+y)$

$\boxed{(3-a)(x+y)}$

20) $a(x-2)-b(2-x)$

$\boxed{(x-2)(a+b)}$

21) $3(a-7)+b(7-a)$

$\boxed{(3-b)(a-7)}$

22) $x^2+3x+2x+6$

$\boxed{(x+2)(x+3)}$

23) $x^2-5x+4x-20$

$\boxed{(x-5)(x+4)}$

24) $xy+4y-2x-8$

$\boxed{(x+4)(y-2)}$

25) $ax+bx-ay-by$

$\boxed{(a+b)(x-y)}$

26) x^2y-3x^2-2y+6

$\boxed{(x^2-2)(y-3)}$

27) $2ax^2+bx^2-4ay-2by$

$\boxed{(x^2-2y)(2a+b)}$

28) x^ny-5x^n+y-5, **where** $(n>0)$

$\boxed{(y-5)(x^n+1)}$

29) $a^nx^n+2a^n+x^n+2$, **where** $(n>0)$

$\boxed{(a^n+1)(x^n+2)}$

30) x^3+x^2+2x+2

$\boxed{(x+1)(x^2+2)}$

31) y^3-y^2+3y-3

$\boxed{(y-1)(y^2+3)}$

32) $2x^3-x^2+4x-2$

$\boxed{(2x-1)(x^2+2)}$

33) $2y^3-y^2+6y-3$

$\boxed{(2y-1)(y^2+3)}$

Factor Trinomials of the form: x^2+bx+c **, [If factoring is impossible write non-factorable over the integers.]**

34) $x^2-8x+15$

$\boxed{(x-5)(x-3)}$

35) $x^2+12x+20$

$\boxed{(x+2)(x+10)}$

36) $a^2+12a+11$

$\boxed{(a+1)(a+11)}$

37) $y^2-18y+72$

$\boxed{(y-12)(y-6)}$

38) $b^2+4b-32$

$\boxed{(b-4)(b+8)}$

39) $b^2-6b-16$

$\boxed{(b-8)(b+2)}$

40) $x^2-7x-12$

Non-Factorable OTI

41) $a^2-3ab+2b^2$

$\boxed{(a-2b)(a-b)}$

42) $a^2+8ab-33b^2$

$\boxed{(a-3b)(a+11b)}$

43) $x^2+5xy+6y^2$

$\boxed{(x+2y)(x+3y)}$

Factor Trinomials of the form: ax^2+bx+c, where $a \neq 1$. [If factoring is impossible write <u>non-factorable over the integers.</u>]

44) $2x^2+7x+3$

$\boxed{(x+3)(2x+1)}$

45) $2x^2-11x-40$

$\boxed{(x-8)(2x+5)}$

46) $4y^2-15y+9$

$\boxed{(y-3)(4y-3)}$

47) $6b^2-b-35$

$\boxed{(2b-5)(3b+7)}$

48) $12y^2-13y-72$

Non-Factorable OTI

49) $4x^2+9x+10$

Non-Factorable OTI

50) $6x^2+5xy-21y^2$

$\boxed{(2x-3y)(3x+7y)}$

51) $4a^2+43ab+63b^2$

$\boxed{(4a+7b)(a+9b)}$

52) $18x^2+27xy+10y^2$

$\boxed{(3x+2y)(6x+5y)}$

53) $6-7x-5x^2$

$\boxed{(x+2)(3-5x)}$

54) $15-14a-8a^2$

$\boxed{(2a+5)(3-4a)}$

55) $35-6b-8b^2$

$\boxed{(2b+5)(7-4b)}$

Using multiple factoring techniques. [If factoring is impossible write non-factorable over the integers.]

56) $820x-8x^2-4x^3$

$\boxed{-4x\left(x^2+2x-205\right)}$

57) $20x^2-38x^3-30x^4$

$\boxed{-2x^2\left(3x+5\right)\left(5x-2\right)}$

58) $4x^2y^2-32xy+60$

$\boxed{4\left(xy-5\right)\left(xy-3\right)}$

59) $2a^2b^4+9ab^3-18b^2$

$\boxed{b^2\left(ab+6\right)\left(2ab-3\right)}$

60) $4x^4-45x^2+80$

$\boxed{\text{Non-Factorable OTI}}$

61) $16x^2y^3+36x^2y^2+20x^2y$

$\boxed{4x^2y\left(y+1\right)\left(4y+5\right)}$

62) $x^{3n}+10x^{2n}+16x^n$

$\boxed{x^n\left(x^n+2\right)\left(x^n+8\right)}$

63) $10x^{2n}+25x^n-60$

$\boxed{5\left(x^n+4\right)\left(2x^n-3\right)}$

Find all integers k such that the trinomial can be factored over the integers.

64) x^2+kx+8

$\boxed{k=6,-6,\ 9,-9}$

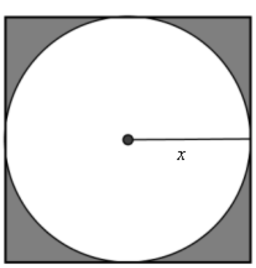
65) $3x^2+kx+5$

$\boxed{k=8,-8,\ 16,-16}$

66) $2x^2-kx-5$

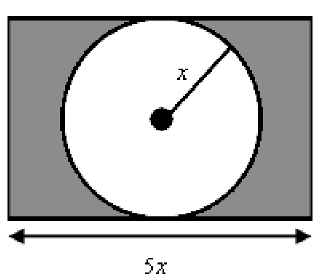
$\boxed{k=3,-3,\ 9,-9}$

[Geometry] Write the area of the shaded region in factored form. Leave your answer in terms of π and the variables shown in the figures below.



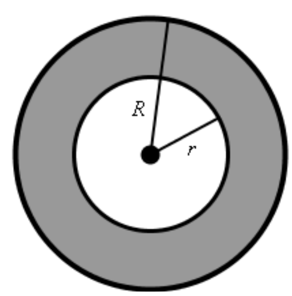
67)

$\boxed{Area=x\left(x-\pi\right)}$



68)

$\boxed{Area=x^2\left(10-\pi\right)}$



69)

$\boxed{Area=\pi\left(R^2-r^2\right)}$